

Bellwork: 4/9/13

Solve the following rational equation. Don't forget your restrictions!

$$\frac{5x}{x^2-x-6} - \frac{3(x+2)}{x-3} = \frac{x(x-3)}{x+2}$$

$$(x-3)(x+2) \mid (x-3) \mid (x+2)$$

$$5x - 3(x+2) = x(x-3)$$

$$5x - 3x - 6 = x^2 - 3x$$

$$\begin{array}{r} 2x - 6 = x^2 - 3x \\ -x^2 + 3x + 6 \\ \hline 1 = x^2 - 5x + 6 \end{array}$$

LCD: $(x-3)(x+2)$

Res: $x-3=0$ $x+2=0$

$x \neq 3, -2$

$(x-3)(x-2)=0$

$x \neq 3, 2$

$x=2$

10) $\frac{x+3(x-4)}{x^2+3x-4} = \frac{x+2(x-1)}{x^2-16}$

$$(x-4) \boxed{x+4} (x-1) \mid \boxed{x+4} (x-4) (x-1)$$

LCD: $(x+4)(x-1)(x-4)$

Res: $x+4=0$ $x-1=0$ $x-4=0$
 $x \neq -4, 1, 4$

$$(x+3)(x-4) = (x+2)(x-1)$$

$$x^2 - 4x + 3x - 12 = x^2 - x + 2x - 2$$

$$\cancel{x^2} - x - 12 = \cancel{x^2} + x - 2$$

$$\begin{array}{r} -x - 12 = x - 2 \\ -x - 12 = x - 2 \\ -12 = 2x - 2 \\ -10 = 2x \end{array}$$

$x=-5$

11) $\frac{x \overset{(x-3)}{\cancel{x+3}} - x \overset{(x+3)}{\cancel{x-3}}}{\frac{(x+3)}{\cancel{(x-3)}} \cdot \frac{(x-3)}{\cancel{(x+3)}}} = \frac{x^2+9}{x^2-9}$

LOD: $\frac{(x+3)(x-3)}{x^2-9}$

Res: $x \neq -3, 3$

$x(x-3) - x(x+3) = x^2 + 9$

$\cancel{x^2} - 3x - \cancel{x^2} - 3x = x^2 + 9$

$-6x = x^2 + 9$
 $+6x \quad +6x$

$0 = x^2 + 6x + 9$
 $(x+3)(x+3)$

$x+3=0 \quad x=-3$

no solution

